IN THE DRAWINGS

Please replace all drawing sheets with the five replacement sheets for FIGs. 1 – 5.

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REMARKS

The following remarks are deemed fully responsive to the outstanding office action mailed November 5, 2004. Five drawing replacement sheets are enclosed. Claims 11 and 17 are amended attend to the Examiner's objections and rejections. Claims 1 – 17 remain pending, of which claims 1, 12 and 15 are independent.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4). FIG. 3 is amended to show reference characters 104(2) and 104(N) correctly.

The Examiner objects to all drawings because a header is shown on each page. Replacement sheets with this header information removed are provided for all drawings. However, we would like to bring 37 CRF § 1.84(c) to the Examiner's attention.

37 CRF § 1.84(c) states:

> *Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin.*

We have included header information on many previous applications without complaint, and would respectfully appreciate clarification as to the Examiner's reason for objection.

Reconsideration of FIGs. 1-5 is respectfully requested.

Specification

The disclosure is objected to because of a typographical error on page 5. Paragraph [0018] of the specification is amended to correct this typographical error without adding new matter.

Reconsideration is respectfully requested.

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Claim Objections

Claim 17 is objected to because of an informality. Claim 17 is amended to correct this informality and without adding new matter.

Claim Rejections – 35 U.S.C. § 112

Claim 11 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 11 depends from claim 9 and refers to the steps of fetching, distributing and bypassing of claim 9. To clarify, claim 11 is amended to further clarify the step of bypassing. No new matter is added; reconsideration is requested.

Claim Rejections – 35 U.S.C. § 102

Claims 1-14 stand rejected under 35 U.S.C. § 102(e) as being taught by U.S. Patent Number 6,269,437 granted to Batten et al., (hereinafter "Batten") (note, the office action states 6,269,439, which we believe is a typographical error). Applicant respectfully disagrees.

To anticipate a claim, Batten must teach every element of the claim and "the identical invention must be shown in as complete detail as contained in the ... claim." *MPEP 2131* citing *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989). Batten does not teach every element of claims 1-14.

The immediate application "processes bundles of instructions preferentially through clusters such that bypassing is substantially maintained within a single cluster." See paragraph [0004] of the specification. Paragraph [0014] of the specification, for example, recites "decode unit 130 detects and then distributes bundled instructions to the program counters 104 according to the threads associated with the instructions." The specification continues that in a wide mode "bundled instructions from the same thread are processed through multiple clusters 102 at the same time," and that in a throughput mode "bundled instructions from one thread are processed through one program counter 104, and through a corresponding cluster 102;

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bundled instructions from other threads are likewise processed through another program counter and cluster pair 104, 102." Thus, the processor of the immediate application clearly has two modes of operation: (1) throughput mode, processing one thread per cluster, and (2) wide mode, processing one thread through multiple clusters. Bypassing between clusters can be reduced by processing bundled singly-threaded instructions within a cluster, thereby avoiding delays associated with bypassing between clusters.

On the other hand, Batten is concerned with "reducing port pressure of clustered microprocessors." See Batten col. 4, lines 65-66. Batten does not disclose, or even suggest, two modes of operation, the bundling of instructions, or the processing of instructions from one thread through one cluster. In fact, Batten does not disclose any specific method of processing instructions at all, let alone bundling instructions in association with threads.

In particular, claim 1 recites a method for processing bundled instructions through execution units of a processor, including the steps of:
a) fetching a first bundle of singly-threaded instructions;
b) distributing the first bundle to a first cluster of the execution units for execution therethrough;
c) fetching a second bundle of singly-threaded instructions; and
d) distributing the second bundle to a second cluster of the execution units for execution therethrough.

As noted, Batten does not disclose or suggest bundling instructions, nor fetching singly-threaded instructions as required by step a). Batten also does not disclose or suggest distributing bundled instructions to a specific cluster, as required by step b). Batten further does not disclose fetching a second bundle of singly-threaded instructions, as required by step c). And Batten does not disclose executing singly-threaded instructions on a specific cluster, as required by step d).

Notably, Batten makes no distinction between processing of threads and does not teach, suggest or disclose the bundling of instructions. Batten, therefore, cannot anticipate claim 1. Reconsideration of claim 1 is respectfully requested.

Claims 2-11 depend from claim 1 and benefit from like argument. However, these claims have additional features that patentably distinguish over Batten. For

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example, claim 2 recites processing the first bundle within the first cluster. Claim 3 recites processing the second bundle within the second cluster. As argued above, Batten does not disclose processing bundled instructions within a cluster.

Claim 7 recites decoding instructions into the first bundle of the singly-threaded instructions. Claim 8 recites decoding instructions into the second bundle of the singly-threaded instructions. Batten does not disclose decoding singly-threaded instruction into a first or second bundle, and therefore cannot teach limitations of claims 7 and 8.

Claim 9 recites fetching a third bundle of singly-threaded instructions, distributing the third bundle to the first and second clusters of the execution units for execution therethrough, and bypassing data between the clusters, as needed, to facilitate processing of the third bundle through the clusters. Again, Batten does not teach fetching, distributing or bypassing data between clusters for bundled instructions, and therefore cannot teach claim 9.

Claim 11 recites selecting a configuration bit prior to the steps of fetching the third bundle, distributing the third bundle, and bypassing data between the clusters. Batten does not disclose a configuration bit for determining a mode of operation, and, as argued above, does not disclose bundles of instructions.

In view of the above arguments, Batten does not anticipate any of claims 2-11. Reconsideration of claims 2-11 is respectfully requested.

Claim 12 recites a method for processing bundled instructions through execution units of a processor, including the steps of:

a) fetching a first bundle of singly-threaded instructions;

b) distributing the first bundle to two or more clusters of the execution units for execution therethrough; and

c) bypassing data between the clusters, as needed, to facilitate processing of the first bundle through the clusters.

As argued above, Batten does not disclose or suggest fetching a first bundle of singly-threaded instructions, as required by step a). Batten further does not disclose or suggest distributing bundled instructions to two or more clusters, as required by step b).

Batten, therefore, also cannot anticipate claim 12. Reconsideration of claim 12 is respectfully requested.

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Claims 13 and 14 depend from claim 12 and benefit from like argument. However, these claims have additional features that patentably distinguish over Batten. For example, claim 13 recites fetching a second bundle of singly-threaded instructions, distributing the second bundle to one of the clusters for execution therethrough, fetching a third bundle of singly-threaded instructions, and distributing the third bundle to another one of the clusters units for execution therethrough. As argued above, Batten does not disclose or suggest fetching a bundle of singly-threaded instructions or of distributing bundles of instructions to clusters.

Claim 14 recites selecting a configuration bit prior to the steps of fetching the second bundle, distributing the second bundle, fetching a third bundle and distributing the third bundle. Again, Batten fails to disclose selecting a configuration bit prior to fetching and distributing second and third bundles of instructions.

Batten cannot, therefore, anticipate claims 13 and 14; reconsideration is requested.

Claims 15-17 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Number 5,729,761 granted to Murata et al., (hereinafter "Murata"). Applicant respectfully disagrees.

To anticipate a claim, Murata must teach every element of the claim and "the identical invention must be shown in as complete detail as contained in the ... claim." *MPEP 2131* citing *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989). Murata does not teach every element of claims 15-17.

Murata discloses a system for upgrading a program executed by one cluster of a plurality of clusters. Murata discloses that the plurality of clusters operate in a restricted mode, whereby one cluster may be upgraded while allowing the remaining clusters to continue operation. Murata does not however disclose a user selectable mode of operation for the clusters whereby throughput is improved or a thread's performance is improved.

In particular, claim 15 recites a processor architecture of the type having two or more clusters of execution units for processing instructions, the improvement including a thread decoder for grouping instructions into singly threaded bundles and for distributing the bundles to the clusters according to either a wide mode or throughput mode of operation.

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Murata does not disclose or suggest a thread decoder for grouping instructions into singly-threaded bundles and for distributing the bundles to the clusters according to either a wide mode or throughput mode of operation, as required by claim 15. Murata instead discloses "a cluster non-restricted mode in which the distributed processing of any one job among processors belonging to any cluster is permitted, and a cluster restricted mode in which the distributed processing of one job among processors belonging to different clusters is restricted." See Murata col. 1, lines 57-61. Moreover, Murata does not teach use of singly-threaded bundles of instructions.

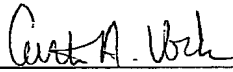In short, Murata cannot anticipate claim 15. Reconsideration of claim 15 is respectfully requested.

Claims 16 and 17 depend from claim 15 and benefit from like argument. However, these claims have additional features that patentably distinguish over Murata. For example, claim 17 recites the thread decoder distributes bundles of singly-threaded instructions through multiple clusters in the wide mode of operation, and wherein the thread decoder distributes bundles of singly-threaded instructions through one of the clusters in the throughput mode of operation.

Murata fails to disclose features of these claims too. Reconsideration is thus also requested for claims 16, 17.

Applicant authorizes the Commissioner to charge Deposit Account No. 12-0600 with a fee of $450 for a two month extension, requested herewith. Applicant believes no other fees are due in connection with this Response; however, if any other fee is deemed necessary, the Commissioner is authorized to charge such fee to Deposit Account No. 08-2025.

Respectfully submitted,

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